भारतीय मानक
Indian Standard

IS 16944 : 2018

दो घटक उच्च निर्मित इपोक्सी टाइटेनियम डाइऑक्साइड (TiO_2) वर्णक मध्यवर्ती लेप — विशिष्टि

Two Components High Build Epoxy Titanium Dioxide (TiO_2) Pigmented Intermediate Coat — Specification

ICS 87.040

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December 2018 **Price Group 2**

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Paints, Varnishes and Related Products Sectional Committee had been approved by the Chemical Division Council.

This standard specifies requirements and method of sampling and test for two component epoxy Titanium Dioxide (TiO_2) pigmented intermediate coat. This material is used for adhesion on inorganic zinc silicate coating and epoxy based primers with high toughness and abrasion resistance. This material is used as an intermediate coat for painting of steel equipment and steel structures of thermal power plants, where protections from salt water, chemicals, mineral oils, solvents and resistance to moisture, protection under marine/refinery conditions are required.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding of numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

TWO COMPONENTS HIGH BUILD EPOXY TITANIUM DIOXIDE (TiO_2) PIGMENTED INTERMEDIATE COAT — SPECIFICATION

1 SCOPE

1.1 This standard specifies the requirements and method of sampling and test for two component epoxy titanium dioxide (TiO_2) pigmented intermediate coat.

1.2 This material is expected to have adhesion on inorganic zinc silicate coating and epoxy based primers with high toughness and abrasion resistance. This material is used as an intermediate coat for painting of steel equipment and steel structures of thermal power plants, where protections from salt water, chemicals, mineral oils, solvents and resistance to moisture, protection under marine/refinery conditions are required.

2 REFERENCES

The standards listed below contain provisions, which through reference in this text, constitute provisions of and necessary adjuncts to this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
101 (Part 1/Sec 1) : 1986	Methods of sampling and test for paints, varnishes and related products: Part 1 Test on liquid paints (general and physical), Section 1 Sampling (*third revision*)
101 (Part 1/Sec 3) : 1986	Methods of sampling and test for paints, varnishes and related products: Part 1 Test on liquid paints (general and physical), Section 3 Preparation of panels (*third revision*)
101 (Part 1/Sec 5) : 1989	Methods of sampling and test for paints, varnishes and related products: Part 1 Test on liquid paints (general and physical), Section 5 Consistency (*third revision*)
101 (Part 1/Sec 6) : 1987	Methods of sampling and test for paints, varnishes and related products: Part 1 Test on liquid paints (general and physical), Section 6 Flash point (*third revision*)
101 (Part 1/Sec 7) : 1987	Methods of sampling and test for paints, varnishes and related products: Part 1 Test on liquid paints (general and physical), Section 7 Mass per 10 litre (*third revision*)
101 (Part 3/Sec 1) : 1986	Methods of sampling and test for paints, varnishes and related products: Part 3 Test on paint film formation, Section 1 Drying time (*third revision*)
101 (Part 3/Sec 2) : 1989	Methods of sampling and test for paints, varnishes and related products: Part 3 Test on paint film formation, Section 2 Film thickness (*third revision*)
101 (Part 3/Sec 4) : 1987	Methods of sampling and test for paints, varnishes and related products: Part 3 Test on paint film formation, Section 4 Finish (*third revision*)
101 (Part 4/Sec 2) : 1989	Methods of sampling and test for paints, varnishes and related products, Part 4 Optical tests on paint films, Section 2 Colour (*third revision*)
101 (Part 5/Sec 1) : 1988	Methods of sampling and test for paints, varnishes and related products,: Part 5 Mechanical tests on paint films, Section 1 Hardness test (*third revision*)
101 (Part 5/Sec 2) : 1988	Methods of sampling and test for paints, varnishes and related products: Part 5 Mechanical tests on paint films, Section 2 Flexibility and adhesion tests (*third revision*)

IS No.	*Title*
101 (Part 6/Sec 1) : 1988	Methods of sampling and test for paints, varnishes and related products: Part 6 Durability test on paint films, Section 1 Durability under conditions of Condensation
101 (Part 8/Sec 6) : 1993	Methods of sampling and test for paints, varnishes and related products: Part 8 Test for pigments and other solids, Section 6 Volume solid
1070 : 1992	Reagent grade water (*third revision*)
1303 : 1983	Glossary of terms relating to paint (*second revision*)
13238 : 1991	Epoxy based zinc phosphate primer (two pack) — Specification

3 TERMINOLOGY

For the purpose of this standard the terms and definitions used in IS 1303 shall apply.

4 REQUIREMENT

4.1 Composition

Paints complying with this standard shall comprise epoxy resin as the principal binder. The manufacturer shall specify the principal type of binder used in the paint, which shall have epoxy equivalent in the range of 350 to 600. The composition of paint shall be such that it satisfies the requirements specified in this standard.

4.1.1 The paint shall consist essentially of two components, base and hardener, or catalyst solution to be mixed in the appropriate ratio by volume, as prescribed by the manufacturer, to meet the requirements of this standard.

4.2 The material shall also conform to the requirements specified in Table 1.

4.3 Keeping Properties

The material shall conform to the requirements specified in Table 1 when tested after storing for a period of minimum one year from the date of manufacture, when stored in original sealed containers under normal atmospheric conditions.

5 TESTS

5.1 Unless specified otherwise, methods of test prescribed in IS 101 series of standards shall be followed.

5.2 For all tests, mild steel panels shall be prepared except for bend test for which burnished tin plate panels shall be used. The preparation of metal panels shall be as prescribed in IS 101 (Part 1/Sec 3).

5.3 Quality of Reagents

Unless or otherwise specified, analytical reagent grade chemicals and reagent grade water (*see* IS 1070) shall be used.

NOTE — Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

5.4 Test certificate shall be in a format as agreed between the purchaser and the manufacturer.

6 PACKING AND MARKING

6.1 Packing

The material shall be packed in dual containers as agreed between the purchaser and the manufacturer. It shall be ensured that the quality of material does not deteriorate during transit and storage.

6.2 Marking

6.2.1 Each container shall be marked with the following information:

a) Indication of the source of manufacture;
b) Batch/Lot number in code or otherwise;
c) Month and year of manufacture;
d) Date of expiry;
e) Mass of the material; and
f) Mixing ratio.

6.2.2 BIS Certification Marking

The product may also be marked with the Standard Mark on the container.

6.2.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act,* 2016 and the Rules and Regulations made there under. The details of the conditions under which the licence for use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

7 SAMPLING

Representative samples shall be drawn as prescribed in **6** of IS 101 (Part1/Sec 1).

Table 1 Requirements of Epoxy Titanium Dioxide Pigmented Intermediate Coat

(*Clause* 4.2, 4.3 and 5.1)

Sl No.	Characteristic	Requirement	Method of Test (Reference to IS 101)	Reference to Annex
(1)	(2)	(3)	(4)	(5)
		WET PAINT		
i)	Mass in kg/10 l, *Min*	14.0	Part 1 / Sec 7	—
ii)	Consistency	To pass the test	—	A
iii)	Flash Point	Above 20°C	Part 1 / Sec 6	—
iv)	Drying time, *Max*		Part 3 / Sec 1	
	a) Surface dry	4 h		
	b) Hard dry	16 h		
v)	Percent volume solids, *Min*	55	Part 8 / Sec 6	—
vi)	Titanium Dioxide (TiO_2), Rutile, percent by mass of total pigment, Min			
vii)	Pot life, Min	6 h	—	B
	NOTE — Tests from SI. No. (i) to (vi) are for mixed paint.			
		DRY COAT		
i)	Dry film thickness per coat, Min	75-100 microns	Part 3 / Sec 2	—
ii)	Colour	Brown	Part 4 / Sec 2	—
iii)	Finish	Egg shell / matt	Part 3 / Sec 4	—
iv)	Flexibility and adhesion test:			
	a) Bend test@ (with Type 1 apparatus using 6.25 mm diameter mandrel)	Shall not show any sign of cracking or loss of adhesion	2 of Part 5 / Sec2	—
	b) Scratch hardness test (1 500 g)	To pass the test	3 of Part 5 / Sec2	—
v)**	Resistance to humidity under condition of condensation at 500 h:			
	a) Resistance to humidity for 500 h	To pass the test	2 of Part 6 / Sec 1	—
	b) Resistance to salt spray for 500 h	To pass the test	3 of Part 6 / Sec 1	

@ Test shall be carried out after curing burnished tin plate panels for 7 days, as prescribed in **2.4.1** of IS 101 (Part 5/Sec 2).

** These tests shall be conducted for a system consisting of one coat of epoxy zinc phosphate primer (see IS 13238) or equivalent primer, as agreed between the purchaser and the manufacturer, and one coat of intermediate paint.

ANNEX A

[*Table* 1, *Sl No*. (ii)]

CONSISTENCY

A-1 APPARATUS

A-1.1 Palette Knife or Metal Rod

A-1.2 Panels

Unless specified otherwise, steel panels prescribed in 2 of IS 101 (Part 1/Sec 3) shall be prepared and used.

A-2 PROCEDURE

A-2.1 Insert a clean metal rod or palette knife into the original container and examine the nature of settling.

A-2.2 Observations

The material shall not cake hard inside the container and shall be in such a condition that stirring easily produces a smooth uniform paint suitable for coating on steel.

ANNEX B

[*Table* 1, *Sl No*. (vii)]

DETERMINATION OF POT LIFE

B-1 GENERAL

The time taken to double the viscosity from the original value shall be considered as the pot life of the material.

B-2 PROCEDURE

B-2.1 Thoroughly mix component parts in the ratio prescribed by the manufacturer to give a sample of 200 ml by volume.

B-2.2 Within 10 min of mixing (**B-2.1**), determine the viscosity as prescribed in IS 101 (Part 1/Sec 5).

B-2.3 Allow the mixed sample of paint to stand in a suitable air-tight container and determine the viscosity at the end of the specified time.

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This Indian Standard has been developed from Doc No.: CHD 20 (10105).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Published by BIS, New Delhi